

REMARKS

Claims 1-20 are pending.

These claims were rejected on the following basis:

Claims 1-8, 10 and 12-19 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 5,962,962 Fujita et al (Fujita). Paragraph 2 of the Action.

Claims 9 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Fujita in view of U.S. Patent 5,932,363 Hu et al (Hu). Paragraph 4 of the Action.

Claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Fujita in view of U.S. Patent 6,049,167 Onitsuka et al (Onitsuka). Paragraph 5 of the Action.

These rejections are respectfully traversed.

The Examiner's reading of and application of the prior art is set forth in the Action in detail, and will not be repeated here except as necessary to an understanding of Applicant's traversal.

While Applicant provides more detailed comments, Applicant initially wishes to emphasize the following differences between the present invention and Fujita.

A major difference is the material in the sealed space of the electroluminescent (EL) devices involved. In accordance with the present invention, the "material" in the sealed space of the EL device is an inert gas. In accordance with the prior art, the "material" is a liquid.

Further, the composition of the luminescent layer of the present invention contains a "phosphorescent compound".

Finally, given the teaching of the prior art, Applicant respectfully submits there is no motivation in the prior art to reach the present invention, nor the unexpected results obtained in accordance with the present invention as shown by the Examples in the present specification.

Applicant now turns directly to the prior art.

Fujita.

Fujita discloses an organic light emitting device with an inert liquid layer having a dissolved oxygen concentration of 1 ppm or less. The present invention relates to a method for producing a light emitting device when sealing parts are disposed in an inert gas atmosphere where both the moisture and oxygen concentrations are 100 ppm or less. In accordance with the present invention, atmosphere means gaseous state, not liquid state (see the attached excerpt from McGraw-Hill, Dictionary of Scientific and Technical Terms).

In Fujita, the space at the periphery of the EL device is filled with an inert liquid. Liquid means a state of matter intermediate between that of crystalline substances and gases (see the attached excerpt from McGraw-Hill), and does mean a gaseous state.

Fujita thus cannot anticipate or render the present claims obvious because the filled “material” in Fujita is different from that of the present invention, and, of course, Fujita does not disclose or provide any motivation for changing the material from a “liquid” to a “gas”.

The only specific examples of Fujita of the inert liquid include perfluoroalkanes, perfluoroamines and perfluoroethers; see Fujita, col. 3, lines 47-49.

As an additional point, Fujita does not disclose the use of an EL device where “one or more organic layers comprises a light-emitting layer containing a phosphorescent compound” as

called for in claims 1 and 12 of the present application. Thus, Fujita cannot anticipate the present claims.

Further, there is no suggestion in Fujita that an EL device formed in accordance with the method of claim 1 or an EL device as claimed in claim 12 would exhibit the superior properties shown by the EL device of the present invention as compared to an EL device which does not meet the limitation that both the moisture and oxygen concentrations are 100 ppm or less. Compare, in this regard, the results set forth in Table 1 at page 25 of the specification for Example 1 (30 ppm H₂O, 30 ppm O₂), Example 2 (70 ppm H₂O, 80 ppm O₂) and Example 3 (100 ppm H₂O, 100 ppm O₂) versus the results with Comparative Example 1 (200 ppm H₂O, 30 ppm O₂) and Comparative Example 2 (30 ppm H₂O, 200 ppm O₂). Note that in Comparative Example 1 and Comparative Example 2, either the H₂O amount (Comparative Example 1) or the O₂ amount (Comparative Example 2) did not meet the limit of the claims herein and the results regarding reductions in luminescence, light-emitting efficiency and durability were poor as compared to the results obtained with Examples 1-3.

Fujita further discloses that commercially available liquid fluorinated, apparently as they come “off the shelf”, cannot be used (Fujita, col. 3, lines 64 - col. 4, line 13).

If a device were to be formed following the teaching of Fujita, and the device were to break (e.g., crack, etc.), leakage of the Fujita liquid might occur. The present invention does not require the use of a liquid nor purification of a commercially available “off the shelf” liquid as apparently required in Fujita (col. 4, lines 5-12). Thus, the present invention provides several industrial advantages as compared to Fujita.

Fujita does disclose (col. 7, lines 60-65 and col. 16, lines 52-57 as exemplary) that the Fujita liquid can be charged into the space in a glove box in which the atmosphere was purged with nitrogen gas. However, Fujita merely discloses that the atmosphere was purged with nitrogen gas, whereafter further filling of liquid to form the liquid layer occurs. Thus, Fujita thus quite clearly does not teach using the inert gas of the present invention as a “permanent” part of the final device obtained, even if Fujita does teach the use of an “inert liquid”.

In short, Fujita clearly cannot anticipate the claims of the present invention and, Applicant submits, Fujita cannot render the claims of the present application obvious because there is no teaching, suggestion or motivation in Fujita to reach the method or device claimed herein.

With respect to the remaining rejections, namely, the rejections over Fujita in view of Hu and Fujita in view of Onitsuka, since it is Applicant’s position that since Fujita does not disclose or suggest the invention claimed, Fujita, even if modified by Hu or Onitsuka, cannot render claims 9 and 20 (Hu) or claim 11 (Onitsuka obvious).

Withdrawal of all rejections is requested.


With respect to the amendment to claims 1 and 12, the amendments limits the claims to the use of an inert gas and the equivalents thereof.

Bases for the limitation occurs at, for example, page 8, last line, page 9, line 7 and the working Examples.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/000,323

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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McGraw-Hill

Dictionary of Scientific and Technical Terms

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lipid proteinosis [MED] A hereditary disorder characterized by extracellular deposits of phospholipid-protein conjugate involving various areas of the body, including the skin and air passages.

lipid storage disease [MED] Any of various rare diseases characterized by the accumulation of large histiocytes containing lipids throughout reticuloendothelial tissues; examples are Goucher's disease, Neimann-Pick disease, and amaurotic familial idiocy.

lipin [BIOCHEM] 1. A compound lipid, such as a cerebroside. 2. See lipid.

lipoblastoma See liposarcoma.

lipochondrodystrophy See Hurler's syndrome.

lipochrome [BIOCHEM] Any of various fat-soluble pigments, such as carotenoid, occurring in natural fats. Also known as chromolipid.

lipodystrophy [MED] A disturbance of fat metabolism in which the subcutaneous fat disappears over some regions of the body, but is unaffected in others.

lipofuscin [BIOCHEM] Any of a group of lipid pigments found in cardiac and smooth muscle cells, in macrophages, and in parenchyma and interstitial cells; differential reactions include sudanophilia, Nile blue staining, fatty acid, glycol, and ethylene.

lipogranuloma [MED] A small mass of fatty tissue associated with granulomatous inflammation.

lipic acid [BIOCHEM] $C_8H_{14}O_5S_2$ A compound which participates in the enzymatic oxidative decarboxylation of α -keto acids in a stage between thiamine pyrophosphate and coenzyme A.

lipoid [BIOCHEM] 1. A fatlike substance. 2. See lipid.

lipodemia See lipemia.

lipodosis See lipodiosis.

lipoid pneumonia See lipid pneumonia.

lipoma [MED] A benign tumor composed of fat cells.

lipomatosis [MED] 1. Multiple lipomas. 2. Obesity.

lipomelanotic reticulosis [MED] A form of lymph node hyperplasia characterized by preservation of the architectural structure, inflammatory exudate, and hyperplasia of the reticulum cells which show phagocytosis of hemosiderin, melanin, and occasionally fat. Also known as dermatopathic lymphadenitis.

lipomycetoidae [MICROBIO] A subfamily of oxidative yeasts in the family Saccharomycetaceae characterized by budding cells and a saclike appendage which develops into an ascus.

lipomyxoma See liposarcoma.

lipophore [HISTOL] A chromatophore which contains lipochrome.

lipopolysaccharide [BIOCHEM] Any of a class of conjugated polysaccharides consisting of a polysaccharide combined with a lipid.

lipoprotein [BIOCHEM] Any of a class of conjugated proteins consisting of a protein combined with a lipid.

liposarcoma [MED] A sarcoma originating in adipose tissue. Also known as embryonal-cell lipoma; fetal fat-cell lipoma; infiltrating lipoma; lipoblastoma; lipomyxoma; myxolipoma; myxoma lipomatodes.

lipotrachea [PALEON] An order of the subclass Branchiopoda selected to include the single fossil species *Lepidocaris rhyntien-*

lipotropic [BIOCHEM] Having an affinity for lipid compounds. [PHARM] Having a preventive or curative effect on the deposition of excessive fat in abnormal sites.

lipotropic hormone [BIOCHEM] Any hormone having lipolytic activity on adipose tissue.

lipotyphla [VERT ZOO] A group of insectivorous mammals composed of insectivores which lack an intestinal cecum and in which the stapedia artery is the major blood supply to the brain.

lipoxidase [BIOCHEM] An enzyme catalyzing the oxidation of the double bonds of an unsaturated fatty acid.

liprich prism [OPTICS] A Nicol prism which is placed in the piece of a polarimeter, covering half the field of view, to study the character of polarized light emerging from the instrument.

lipman fringes [OPTICS] Interference fringes in standing

electromagnetic waves generated when light is reflected by a mercury coating at the back of a special fine-grained photographic emulsion; originally used in color photography.

Lipschitz condition [MATH] A function f satisfies such a condition at a point b if $|f(x) - f(b)| \leq K|x - b|$, with K a constant, for all x in some neighborhood of b .

lip-sync [COMMUN] Synchronization of sound and motion picture so that facial movements of speech coincide with the sounds.

lipitinite See exinite.

liq pt See pint.

liquation [MET] 1. Separation of fusible metals from less fusible ones by applying heat. 2. The partial melting of an alloy.

liquefaction [PHYS] A change in the phase of a substance to the liquid state; usually, a change from the gaseous to the liquid state, especially of a substance which is a gas at normal pressure and temperature.

liquefied gas [MATER] A gaseous compound or mixture converted to the liquid phase by cooling or compression; examples are liquefied petroleum gas (LPG), liquefied natural gas (LNG), liquid oxygen, and liquid ammonia.

liquefied natural gas [MATER] A product of natural gas which consists primarily of methane; its critical temperature is about -100°F (-73°C), and thus it must be liquefied by cooling to cryogenic temperatures and must be well insulated to be held in the liquid state; used as a domestic fuel. Abbreviated LNG.

liquefied petroleum gas [MATER] A product of petroleum gases; principally propane and butane, it must be stored under pressure to keep it in a liquid state; it is often stored in metal cylinders (bottled gas) and used as fuel for tractors, trucks, and buses, and as a domestic cooking or heating fuel in rural areas. Abbreviated LPG.

liquefier [ENG] Equipment or system used to liquefy gases; usually employs a combination of compression, heat exchange, and expansion operations.

liqueur [FOOD ENG] An alcoholic beverage prepared by combining a spirit, usually brandy, with certain flavorings and sugar.

liquid [PHYS] A state of matter intermediate between that of crystalline substances and gases in which a substance has the capacity to flow under extremely small shear stresses and conforms to the shape of a confining vessel, but is relatively incompressible, lacks the capacity to expand without limit, and can possess a free surface.

liquid air [PHYS] Air in the liquid state obtained as a faintly bluish, transparent, mobile, intensely cold liquid by compressing purified air and cooling it to a temperature below the boiling points of its principal components, nitrogen and oxygen; used chiefly as a refrigerant.

liquid asphalt See residual oil.

liquid blast cleaning [MET] Cleaning metal surfaces with a suspension of abrasive in water accelerated to high velocities by compressed air, or by a centrifugal wheel.

liquid blocking [PETRO ENG] The blocking or plugging of the sand around an injection-well borehole, usually caused by lubricant carryover from compressors.

liquid bright gold [MATER] Any of several gold compounds applied to ceramics in the form of varnish which is dried and heated to redness, decomposing the compound and leaving a thin film of gold firmly attached to the underlying ceramic; used in decorating china and for the production of printed electrical circuits on ceramics.

liquid-bubble tracer [FL MECH] A method of observing the motion of a liquid by following tiny particles of an immiscible liquid of the same density as the moving liquid.

liquid carburizing [MET] Surface hardening of steel by immersion into a molten bath consisting of cyanides and other salts, for example, at $1600-1750^\circ\text{F}$ ($850-950^\circ\text{C}$).

liquid-column gage See U-tube manometer.

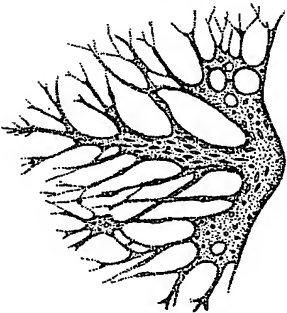
liquid compass [ENG] A compass in a bowl filled with liquid.

liquid-cooled dissipator See cold plate.

liquid-cooled engine [MECH ENG] An internal combustion engine with a jacket cooling system in which liquid, usually water, is circulated to maintain acceptable operating temperatures of machine parts.

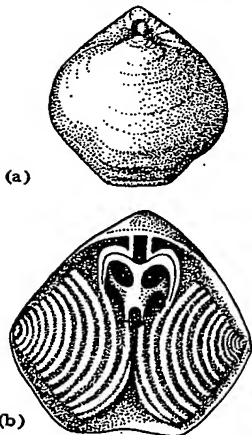
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ATHALAMIDA



A representative athalamid, *Biomysa vagans* (after Leidy). (From R. P. Hall, *Protozoology*, Prentice-Hall, 1953)

ATHYRIDIDINA



Composita, a genus in Athyrididina: (a) dorsal view, (b) ventral view with pedicle cut away to show spire. (From R. C. Moore, ed., *Treatise on Invertebrate Paleontology*, pt. H, Geological Society of America, Inc., and University of Kansas Press, 1965)

atelestitute [MINERAL] $\text{Bi}_2(\text{AsO}_4)_2\text{O}_3(\text{OH})_3$ A yellow mineral consisting of basic bismuth arsenate and occurring in minute crystals; specific gravity is 6.82.

atellois [MED] Infantilism or dwarfism characterized by general, but proportional, underdevelopment and normal intelligence; associated with anterior pituitary deficiencies.

Atelopodidae [VERT ZOO] A family of small, brilliantly colored South and Central American frogs in the suborder Procoela.

Atelostomata [INV ZOO] A superorder of echinoderms in the subclass Euechinoidea characterized by a rigid, exocyclic test and lacking a lantern, or jaw, apparatus.

atephobia [PSYCH] Abnormal fear of financial or social ruin.

Athalamida [INV ZOO] An order of naked amebas of the subclass Granuloreticulosa in which pseudopodia are branched and threadlike (reticulopodia).

Athecanephria [INV ZOO] An order of tube-dwelling, tentaculate animals in the class Pogonophora characterized by a saclike anterior coelom.

athecate [INV ZOO] Lacking a theca.

Atherinidae [VERT ZOO] The silversides, a family of actinopterygian fishes of the order Atheriniformes.

Atheriniformes [VERT ZOO] An order of actinopterygian fishes in the infraclass Teleostei, including flyingfishes, needlefishes, killifishes, silversides, and allied species.

athermalize [ENG] To make independent of temperature or of thermal effects.

athermal transformation [PHYS] A chemical or physical change not requiring a change in the temperature of the substance, as in the formation of martensite.

athermancy [ELECTROMAG] Property of a substance which cannot transmit infrared radiation.

atheroma [MED] 1. Fatty degeneration of the inner arterial walls. 2. A fatty cyst.

atherosclerosis [MED] Deposition of lipid with proliferation of fibrous connective tissue cells in the inner walls of the arteries.

athetosis [MED] Slow, recurrent, involuntary wormlike movements of various parts of the body associated with lesions of the basal ganglia.

athetotic speech [MED] Disorder of articulation rhythm involving a general jerkiness in speech production that interferes with the normal rate of speech; associated with athetosis.

Athey wheel [MECH ENG] A crawler wheel assembly used on tractors for moving over soft terrain.

Athiorhodaceae [MICROBIO] The nonsulfur photosynthetic bacteria, a family of small, gram-negative, nonsporeforming, motile bacteria in the suborder Rhodobacteriineae.

athlete's foot See dermatophytosis.

athodyd [AERO ENG] A type of jet engine, consisting essentially of a duct or tube of varying diameter and open at both ends, which admits air at one end, compresses it by the forward motion of the engine, adds heat to it by the combustion of fuel, and discharges the resulting gases at the other end to produce thrust.

athrocyte [HISTOL] A cell that engulfs extraneous material and stores it as granules in the cytoplasm.

athrogenic [PETR] Of or pertaining to pyroclastics.

athwartship [NAV ARCH] Perpendicular to the fore and aft centerline of a ship.

Athyrididina [PALEON] A suborder of fossil articulate brachiopods in the order Spiriferida characterized by laterally or, more rarely, ventrally directed spires.

Atlantacea [INV ZOO] A superfamily of mollusks in the subclass Prosobranchia.

Atlantic Ocean [GEOGR] The large body of water separating the continents of North and South America from Europe and Africa and extending from the Arctic Ocean to the continent of Antarctica.

Atlantic series [PETR] A great group of igneous rocks, based on tectonic setting, found in nonorogenic areas, often associated with block sinking and great crustal instability, and erupted along faults and fissures or through explosion vents. Also known as Atlantic suite.

Atlantic standard time See Atlantic time.

Atlantic suite See Atlantic series.

Atlantic time [ASTRON] A time zone; the fourth zone west Greenwich. Also known as Atlantic standard time.

atlantite [PETR] An olivine-bearing nepheline tephrite.

atlas [ANAT] The first cervical vertebra. [MAP] A collection of charts or maps kept loose or bound in a volume.

Atlas [ORD] A U.S. Air Force surface-to-surface intercontinental ballistic missile having a range of about 6000 miles and capable of carrying nuclear warheads.

Atlas-Centaur launch vehicle [AERO ENG] A two-stage rocket consisting of an Atlas first stage and a Centaur second stage; used for launching unmanned spacecraft.

atlas grid [MAP] A reference system that permits the designation of the location of a point or an area on a map, photo, or other graphic in terms of numbers and letters. Also known as alphanumeric grid.

Atlas-Johnson tubing joint [PETRO ENG] A tapered, screw-joint for connecting lengths of tubing for oil-well casing strings.

atm See atmosphere.

atmidometer See atmometer.

atmoclast [GEOL] A fragment of rock broken off in place by atmospheric weathering.

atmoclastic [PETR] Of a clastic rock, composed of atmoclasts that have been recemented without rearrangement.

atmogenic [GEOL] Of rocks, minerals, and other deposits derived directly from the atmosphere by condensation, weathering, or deposition from volcanic vapors; for example, snow.

atmolith [GEOL] A rock precipitated from the atmosphere that is, an atmogenic rock.

atmolysis [FL MECH] The separation of gas mixtures by using their relative diffusibility through a porous partition.

atmo-meter See meter-atmosphere.

atmometer [ENG] The general name for an instrument which measures the evaporation rate of water into the atmosphere. Also known as atmometer; evaporation gage; evaporimeter.

atmometry [PHYS] The science of measuring the rate and amount of evaporation of water.

atmophile element [METEOROL] 1. Any of the most typical elements of the atmosphere (hydrogen, carbon, nitrogen, oxygen, iodine, mercury, and inert gases). 2. Any of the elements which either occur in the uncombined state or, as volatile compounds, concentrate in the gaseous primordial atmosphere.

atmosphere [MECH] A unit of pressure equal to 1.013250×10^6 dynes/cm², which is the air pressure at mean sea level. Abbreviated atm. Also known as standard atmosphere.

[METEOROL] The gaseous envelope surrounding a planet or celestial body.

atmospheric absorption [GEOPHYS] The reduction in energy of microwaves by gases and moisture in the atmosphere.

atmospheric acoustics [ACOUS] The science of sound waves in the open air.

atmospheric attenuation [GEOPHYS] A process in which the flux density of a parallel beam of energy decreases with increasing distance from the source as a result of absorption or scattering by the atmosphere.

atmospheric boil See terrestrial scintillation.

atmospheric boundary layer See surface boundary layer.

atmospheric braking [AERO ENG] 1. Slowing down an object entering the atmosphere of the earth or other planet from space by using the drag exerted by air or other gas particles in the atmosphere. 2. The action of the drag so exerted.

atmospheric chemistry [METEOROL] The study of the production, transport, modification, and removal of atmospheric constituents in the troposphere and stratosphere.

atmospheric composition [METEOROL] The chemical abundance in the earth's atmosphere of its constituents, including nitrogen, oxygen, argon, carbon dioxide, water vapor, ozone, neon, helium, krypton, methane, hydrogen, and nitrous oxide.

atmospheric condensation [METEOROL] The transformation of water in the air from a vapor phase to dew, fog, or cloud.

atmospheric control [ORD] 1. Any device or system designed to operate movable aerodynamic control surfaces to direct a guided missile in an atmosphere dense enough for such

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